

REMARKS

This response is being presented in response to the Examiner's action of April 5, 2002.

The Examiner has indicated that claims 1-28 have been rejected. In light of the following detailed arguments, it is respectfully submitted that the claims fully distinguish over the applied prior art.

The Examiner rejected claims 1-21 under 35 USC §103 as being unpatentable over McCurdy (U.S. Patent No. 5,780,149) in view of Terneu et al. The Examiner stated that McCurdy teaches a coated glass article comprising a 3 mm thick substrate with first and second coatings, one of which coatings is an antimony doped tin oxide coating, wherein the glass article exhibits a selectivity of 10 or greater. The Examiner acknowledges that McCurdy is silent as to the second coating being fluorine doped tin oxide deposited on and adhering to the coating of antimony doped tin oxide. The Examiner attests that the Terneu reference disclosed the inclusion of a fluorine doped tin oxide layer on an antimony doped layer provided a low solar factor and emissivity. The Examiner therefore asserts that it would have been obvious to one skilled in the art to replace the second layer with a fluorine doped tin oxide layer.

Claims 22-25 were also rejected over the combination of McCurdy and Terneu. The Examiner indicated that McCurdy shows an insulating glass stack with an insulating unit comprising first and second glass substrates, a multi-layer coating stack with at least first and second coatings, one of which is a coating of antimony-doped tin oxide, wherein the glass article exhibits a selectivity of 10 or greater. The examiner further avers, that the McCurdy reference teaches that the thickness of the first and second layers is dependent upon the desired solar

performance of the stack. The examiner states that Terneu discovered that the inclusion of a fluorine doped tin oxide layer on an antimony doped tin oxide layer provided a low solar factor and emissivity. The examiner thus noted that one of ordinary skill in the art would replace the second layer of McCurdy with the fluorine doped layer of Terneu, in order to obtain lower solar factors and emissivities.

The examiner additionally rejected claims 26-28 under 35 USC §103 as being unpatentable over McCurdy in view of Terneu. The examiner avers that McCurdy teaches a coated glass article comprising the substrate with a 3mm thickness and at least first and second coatings one of which contains antimony doped tin oxide, wherein the glass article exhibits a selectivity of ten or greater. McCurdy teaches the thickness of the first and second layers is dependent upon the desired solar performance of the stack. The examiner acknowledges that McCurdy is silent as to the second coating being fluorine doped tin oxide. The examiner thus concludes that it would have been obvious to one skilled in the art to modify the glass article of McCurdy with the teachings of Terneu, to provide thicknesses within the claimed ranges to affect the solar performance.

Before discussing the prior art in detail applicants wish to discuss the present invention as defined in the independent claims. Independent claim 1 defines a coated glass article comprising a glass substrate, a coating of antimony doped tin oxide depositing on and adhering to said glass substrate. An additional coating of antimony doped tin oxide is deposited on and adheres to the first coating. The thicknesses of the coatings are selected to provide a selectivity of thirteen or more.

Independent claim 22 defines an insulating glass unit. The insulating glass unit comprises first and second glass substrates with a multilayer coating stack deposited on the second glass substrate. A first coating of antimony doped tin oxide is deposited on the surface with a second coating of fluorine doped tin oxide deposited on and adhering to the first coating. The second glass substrate exhibits a difference between visible light transmittance and total solar energy transmittance of thirteen or more.

Independent claim 26 also describes a coated glass article comprising a substrate, a coating of antimony doped tin oxide, and a coating of fluorine doped tin oxide deposited on and adhering to the coating of antimony doped tin oxide.

A review of the prior art shows that the McCurdy reference teaches a glass article having a solar control coating for architectural windows. The article includes a glass substrate and an iridescence suppressing interlayer deposited on and adhering to the surface of the glass substrate. The article further comprises first and second transparent coatings deposited on the iridescence suppressing interlayer. It is important to note that the invention requires that the first and second transparent coatings are chosen such that the difference in the refractive indices of the coatings in the near infrared region are greater than the difference of the refractive indices of the coatings in the visible region. (See, for example, column 3, lines 9-18 and column 5, lines 18-34.) The selection results in an architectural glazing which rejects solar energy in the near infrared region while permitting the transmittance of a high degree of visible light. From this it can be seen that the optimal configuration of the McCurdy reference would require coatings that have essentially

the same refractive index in the visible spectrum and a great difference in their respective refractive indices in the near infrared spectrum. This would optimize transmission of visible light while maximizing the amount of the infrared spectrum transmitted. It can therefore be seen that the selection of the coatings based on these criteria is essential to the purpose of the invention.

The Terneu reference discloses a glazing panel having a solar factor of less than 70 percent and includes a sheet of glass and a coating layer provided on the sheet of glass. The Terneu reference primarily addresses a single Sn/Sb alloy layer. The Terneu reference contains a passing reference to the possibility of a two layer stack, wherein the first layer includes tin and antimony oxides and has a tin to antimony molar ratio of 0.01 to 0.5.

It is important to note that the Terneu reference only discusses the deposition of an antimony/ tin oxide layer followed by the subsequent deposition of a fluorine doped tin oxide layer in column five, lines 36-41, in the Abstract and in the claims on file. In the only place that this is disclosed in the application, Terneu admits that this solution is disadvantageous, by noting that the deposition of an additional layer is time consuming and expensive. A review of the file history of this application shows that the originally filed claims and Abstract did not contain this subject matter, and that this was apparently only added in order to overcome art applied against the application. As shown above, the disclosure of the reference teaches away from a separate layer consisting of fluorine doped tin oxide. It was only during the prosecution of the application that Terneu included subject matter, which the applicant had previously indicated was disadvantageous, into the claims. Based upon this fact, it is submitted that the reference was

teaching away from this solution at the time of the filing of the application, and it was only during prosecution that the applicant *adopted a solution that he had previously defined as disadvantageous*. Thus the Terneu reference, at the time of filing, would not teach the application of a separate fluorine doped tin oxide layer on an antimony doped tin oxide layer, and instead teaches away from this concept. As this concept was not taught by the application as filed, it is therefore submitted that this the art would only be citable as a reference as of the issue date of the application.

Based on the above, it is respectfully submitted that the effective date of this reference would be the date of the patent May 15, 2001, and not the date the application was filed. Therefore, as the present application was filed on July 26, 2000, and has a priority claim which reverts back to August 10, 1999, it is respectfully submitted that the Terneu reference is not an effective reference against the present application. On that basis, it is submitted that it was improper for the examiner to use this reference against the present application, and it is respectfully requested that the present rejection be withdrawn.

However, even if the Terneu reference was properly applied against the present application, it is respectfully submitted that this reference cannot be used in conjunction with the McCurdy reference as was proposed by the Examiner in the Office Action. As discussed above, the McCurdy reference requires that the first and second transparent coatings, which are deposited on an iridescence-suppressing interlayer, are chosen such that the difference in the refractive indices of the coatings in the near infrared region are greater than the difference of the refractive indices of the coatings in the visible region, in order to provide an architectural glazing

which rejects solar energy in the near infrared region while permitting the transmittance of a high degree of visible light. Essentially, this reference requires the combination of an undoped layer, followed by a doped layer, followed by an additional undoped layer.

While, as discussed above, it is believed that the Terneu reference is not citable against the present invention as proposed, it is respectfully submitted that even if this patent was citable as a reference against the present application, it could not be combined with McCurdy reference without destroying the functionality of the McCurdy reference. There are at least two reasons for the impossibility of this combination. First, the Terneu reference discloses the first layer comprising tin and antimony deposited on the substrate. The fluorine doped tin oxide layer is deposited on this layer. This is distinctly in contrast to the McCurdy reference which requires an undoped layer followed by a doped layer. One skilled in the art would understand the tin/antimony layer of Terneu to be a doped layer, and would not anticipate using it in place of the undoped layer required by McCurdy. Thus this required layer of Terneu is in contrast to the requirements of the McCurdy reference, and would destroy the function of the McCurdy reference if combined therewith.

Additionally, the refractive indices of $\text{SnO}_2\text{:F}$ and $\text{SnO}_2\text{:Sb}$ are very similar in both the visible and in the near infrared regions. In practice, the McCurdy reference requires two coatings that act as one layer in the visible spectrum and act as different layers in the near infrared spectrum. As seen on the accompanying chart, that is not the case for a fluorine doped tin oxide layer and an antimony doped tin oxide layer. These layers behave very similarly in both the visible spectrum and in the near infrared spectrum. Thus, once again, the purpose of the

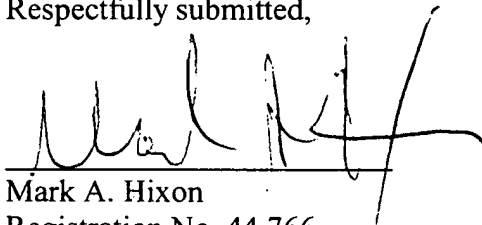
McCurdy invention would be destroyed by combining it with the teachings of Terneu. On the basis of the above, it is again respectfully submitted that it is improper to combine the McCurdy and Terneu references. It is therefore believed that the present rejection should be reconsidered and withdrawn.

Independent claims 22 and 26 provide a similar analysis to that of claim 1. Each of these claims define a coating stack similar to that of claim one, and have the same art applied against them as was applied against claim one. For the reasons stated above, is respectfully submitted that the combination of these references is improper and thus that claims 22 and 26 are also allowable over the applied prior art.

The dependent claims 2-21, 23-25, and 27-28, are believed to be allowable based, at least, upon their dependence on allowable base claims as discussed above.

In view of the above remarks, a favorable reconsideration of the present application and the passing of this application to issue with all claims allowed are courteously solicited. If the Examiner wishes to modify any of the language of the claims in an effort to move the application towards allowance, a telephone call to the undersigned would be greatly appreciated.

Respectfully submitted,



Mark A. Hixon
Registration No. 44,766

ATTORNEYS
Marshall & Melhorn, LLC
Four SeaGate - 8th Floor
Toledo, Ohio 43604
(419) 249-7114